

WE CLAIM:

1. A method for forming a dual damascene structure,
comprising:

5 providing a silicon substrate containing one or more
electronic devices;

forming a first dielectric layer of a first thickness
over said silicon substrate;

10

forming a first etch stop layer over said first
dielectric layer;

15 forming a second dielectric layer of a second
thickness over said first dielectric layer;

forming an anti-reflective coating layer over said
second dielectric layer;

20 etching a first trench to a first depth in said second
dielectric layer wherein the first depth is greater than
the thickness of said second dielectric layer; and

simultaneously etching a second trench to a second depth in said second dielectric layer and etching said first trench in said first dielectric layer wherein the second depth is approximately equal to the second thickness
5 and the first depth is approximately equal to the first thickness.

2. The method of claim 1 wherein said anti-reflective coating layer comprises silicon oxynitride.

10

3. The method of claim 1 wherein first and second etch stop layers are formed with material selected from the group consisting of silicon carbide and silicon nitride.

15 4. The method of claim 1 wherein said first dielectric layer is FSG.

5. The method of claim 1 wherein said second dielectric layer is FSG.

20

6. The method of claim 1 further comprising:

forming a liner film in said first trench and said second trench; and

forming a contiguous copper layer in said first trench and said second trench.

7. A method for forming a copper filled dual damascene structure, comprising:

providing a silicon substrate containing one or more
5 electronic devices;

forming a first dielectric layer of a first thickness
over said silicon substrate;

10 forming a first etch stop layer over said first
dielectric layer;

forming a second dielectric layer of a second
thickness over said first dielectric layer;

15 forming a silicon oxynitride anti-reflective coating
layer over said second dielectric layer;

etching a first trench to a first depth in said second
20 dielectric layer and said first dielectric layer wherein
the first depth is greater than the thickness of said
second dielectric layer; and

simultaneously etching a second trench to a second depth in said second dielectric layer and etching said first trench in said first dielectric layer wherein the second depth is approximately equal to the second thickness
5 and the first depth is approximately equal to the first thickness.

8. The method of claim 1 wherein said silicon nitride anti-reflective coating layer comprises 30 to 50 atomic percent of silicon, 20 to 50 atomic percent of oxygen, 2 to 17 atomic percent of nitrogen, and 7 to 35 atomic percent of hydrogen.
10

9. The method of claim 1 wherein first and second etch stop layers are formed with material selected from the group consisting of silicon carbide and silicon nitride.
15

10. The method of claim 1 wherein said first dielectric layer is FSG.
20

11. The method of claim 1 wherein said second dielectric layer is FSG.

12. The method of claim 1 further comprising:

forming a liner film in said first trench and
said second trench; and

5

forming a contiguous copper layer in said first
trench and said second trench.